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Kindly cancel non-elected claims 1, 19, 20 and 27 without prejudice or disclaimer.

REMARKS

By the present amendment, the specification has been amended as suggested by the Examiner, claims 21 and 24 have been rewritten in an independent format,[1] claims 2-11 have been amended to depend from claim 21, claim 26 has been amended to recite a pneumatic tire, and non-elected claims 1, 19, 20 and 27 have been canceled. Claims 21, 24, 26 and 28 have also been amended to clarify that each of the reinforcement cords has a diameter *d* and that adjacent intra-row cords are spaced apart equal and uniform distances. Claim 10 has also been amended to correct what appears to be typographical error. Upon entry of this amendment, claims 2-18, 21-26 and 28 will be pending in the application. A clean listing of the amended claims is attached.

Restriction Requirement

Election of claims 21-25 and 28 is hereby confirmed. Claims 2-10 have been amended to recite a green tire and claims 26 has been amended to recite a pneumatic tire, whereby examination of these claims in the present application is respectfully requested. Method claims 11-18 have been rewritten to depend from claim 21, whereby rejoinder of these claims upon allowance of claim 21 is respectfully requested.

Claim Rejections - 35 U.S.C. § 102/ §103

Claims 21-25 have been rejected as being anticipated by Japanese Patent Application No. 6-115308 (translation) and claims 21-23 have also been rejected as

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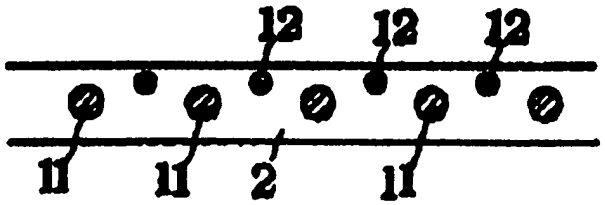
1. These amendments are believed to overcome the objections to the specification and claims.

being obvious over this reference. In this reference, steel cords (11) are conventionally arranged in the carcass (2) and smaller diameter steel cords (12) are buried with a slight vertical deviation between steel cords (11). (See Figure 6, below.)

【図6】



It is respectfully submitted that this reference does not show or suggest a body ply wherein a plurality of rows of reinforcement cords of the same size are embedded in an elastomeric material. Instead, this reference appears to specifically teach the use of different diameter reinforcement cords for different rows.

Claims 21-25 and 28 have been rejected as being anticipated by U.S. Patent No. 5,855,703 to Miyazono. The objective of the Miyazono invention is to allow an increased number of reinforcing elements while still avoiding closed spaces between the reinforcing elements. (Compare Figures 15 and 16, below.) When reinforcing elements 6 are arranged with a closed space 7 therebetween (see Figure 15, below), it is difficult to penetrate rubber into the inside of the closed space. If water penetrates into the inside of the closed space through cut failure from an exterior of the tire, it arrives at cut ends of the reinforcing elements. When the reinforcing elements are used in the carcass ply, corrosion of the reinforcing element can occur over a wide region along the closed space.[2]

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2. The "closed space" problem can, of course, be easily solved by simply widening the distance between mutually adjacent reinforcing elements. However,

FIG_15 COMPARATIVE

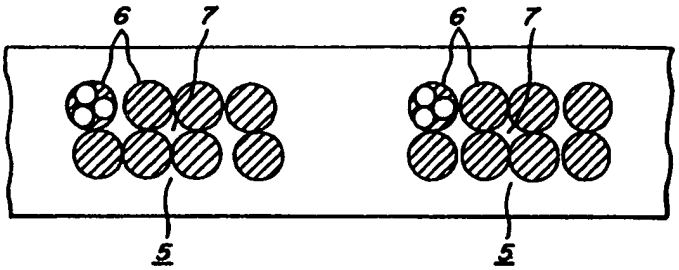
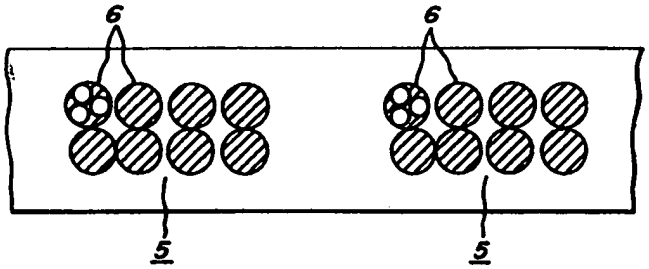


FIG_16



Miyazono addresses the "closed space" problem by dividing the reinforcing elements 6 into groups 5 each having two rows with at least three reinforcing elements 6 in each row. The distances between any four mutually adjacent reinforcing elements within each group is not the same. (See Figure 16, above.) In this manner, any space between intra-group reinforcing elements will be open to the outside of the group,

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Miyazono teaches against this solution when it explains that it is usually desired to reduce the diameter of the reinforcing element because the reduction of tire weight is strongly demanded and also the simplification of the cord used as the reinforcing element is required. As a result, in order to hold the same level of tire strength by using the reinforcing element of smaller diameter, the end count of the reinforcing elements must be increased and, hence, the distance between the mutually adjacent reinforcing elements is rather narrower.

thereby allowing the penetration of rubber therein during the manufacturing process. Alternatively, Miyazono addresses the "closed space" problem by staggering or shifting the rows relative to each other. (Compare Figures 24 and 25, below.)[3]

FIG_24 COMPARATIVE

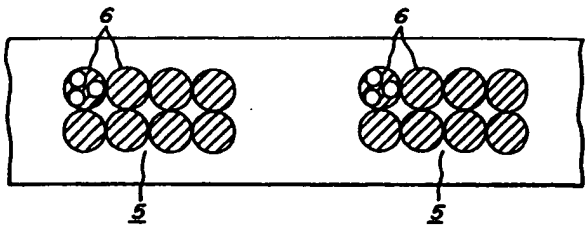
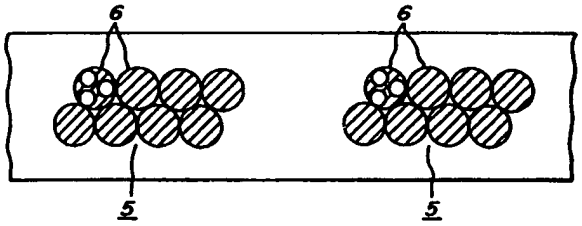


FIG_25



It is respectfully submitted that Miyazono does not show or suggest equal and uniform spacing of intra-row adjacent cords as this would create the very "closed space" problems it is trying to prevent. Instead, this reference specifically teaches either purposely unequal spacing or no spacing between intra-row cords.

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3. The Miyazono patent notes that "[i]n the tire using the ply shown in FIG. 24, cracking created between the steps of the group is connected to the similar cracking created in the adjacent group to grow the separation failure of 3 mm in length in the longitudinal direction of the steel cord. In the tire using the ply shown in FIG. 25, there is no cracking b twe n the steps of the group, but the length of cracking created from an unadhered portion of the steel cord end through pecking is only 1 mm in the longitudinal direction of the steel cord."

C nclusi n

In view of the foregoing, the present application is believed to be in a condition for allowance and an early indication to that effect is earnestly solicited.

Should a petition for an Extension of Time be necessary for the timely reply to the outstanding Office Action (or if such a petition has been made and an additional extension is necessary), petition is hereby made and the Commissioner is authorized to charge any fees (including additional claim fees) to Deposit Account No. 18-0988, Order No. FIREP9905052US.

Respectfully submitted,

RENNER, OTTO, BOISSELLE & SKLAR, P.L.L.

By Cynth S. Murphy
Cynthia S. Murphy
Reg. No. 33,430

1621 Euclid Avenue
Nineteenth Floor
Cleveland, Ohio 44115
(216) 621-1113

CERTIFICATE OF MAILING (37 CFR 1.8a)

I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being deposited with the United States Postal Service on the date shown below with sufficient postage as first class mail in an envelope addressed to: Assistant Commissioner for Patents, Washington, D.C. 20231.

Date: August 20, 2002 Marian E. Vasquez
Marian E. Vasquez

APPENDIX

Detailed listing of changes to both the specification and the claims. Please note, underlining denotes additions and [brackets] denote deletions.

In The Specification:

Page 4, lines 4-9 has been amended as follows:

As shown in Figure 3, the body ply material 12 comprises an elastomer sheet 30 and a plurality of reinforcement cords 32 embedded therein. In the completed tire 10, the reinforcement cords 32 extend in a direction substantially parallel to the tire's axis. During building of the green tire, the reinforcement cords 32 extend in a direction parallel to the axis of the drum 24 and perpendicular to the axial seam.

In The Claims:

Claims 1, 19, 20, and 27 have been cancelled.

Claims 2-11, 18, 21, 24, 26, and 28 have been amended as follows:

2. (Amended) A green tire [body ply] as set forth in claim [1] 21, wherein the reinforcement cords in one row are transversely staggered relative to the reinforcement cords in an adjacent row.

3. (Amended) A [body ply] green tire as set forth in claim 2, wherein the plurality of rows comprise two parallel rows of reinforcement cords.

4. (Amended) A [body ply] green tire as set forth in claim [1] 21, wherein the plurality of rows comprise two parallel rows of reinforcement cords.

5. (Amended) A [body ply] green tire as set forth in claim [1] 21, wherein the elastomer sheet is made of rubber.

6. (Amended) A [body ply] green tire as set forth in claim [1] 21, wherein the sheet has a thickness of about 0.5 mm to about 2.0 mm.

7. (Amended) A [body ply] green tire as set forth in claim 6, wherein the sheet has a width of about 150 mm to about 250 mm.

8. (Amended) A [body ply] green tire as set forth in claim [1] 21, wherein each row comprises between about 50 to about 600 cords.

9. (Amended) A [body ply] green tire as set forth in claim 8, wherein the cords each have a diameter of about 0.3 mm to about 2.0 mm.

10. (Amended) A [body ply] green tire as set forth in claim 9, wherein the reinforcement cords in each row are spaced from adjacent reinforcement cords in the same row a distance of about 0.1 mm to about [2.0] 3.8 mm.

11. (Amended) A method of making the body ply for the green tire of claim [1] 21, comprising the steps of:

introducing the reinforcement cords into a die assembly; and

extruding rubber into a cavity of the die assembly so that rubber is forced around and between the reinforcement cords.

18. (Amended) A method of making the body ply for the green tire of claim [1] 21, comprising the steps of:

replacing an insert in an existing machine used to make steel belts or single layer body ply material with an insert having the passages corresponding to the arrangement of reinforcement cords in the elastomeric sheet;

passing the reinforcement cords through the replacement insert and into a die assembly of the existing machine; and

extruding rubber into a cavity of the die assembly so that rubber is forced around and between the reinforcement cords.

21. (Amended) A green tire incorporating [the] a body ply [of claim 1] comprising an elastomeric sheet and a plurality of rows of reinforcement cords embedded therein, the body ply having edges forming an axially extending seam, wherein each of the reinforcement cords has a diameter *d*, wherein adjacent cords in a first of the plurality of rows are spaced a distance d_{a-a} and wherein adjacent cords in a second of the plurality of rows are spaced a distance d_{b-b} and wherein these distances are equal and uniform.

24. (Amended) A tire incorporating [the] a body ply [of claim 1] comprising an elastomeric sheet and a plurality of rows of reinforcement cords embedded therein, the body ply extending between beads and having lateral end portions turned respectively therearound, wherein each of the reinforcement cords has a diameter *d*, wherein adjacent cords in a first of the plurality of rows are spaced a distance d_{a-a} and wherein adjacent cords in a second of the plurality of rows are spaced a distance d_{b-b} and wherein these distances are equal and uniform.

26. (Amended) A [body ply for a] pneumatic tire incorporating a body ply comprising an elastomeric sheet and two parallel rows of reinforcement cords embedded therein;

each row comprising between about 50 to about 600 cords;

each cord having a diameter *d* of about 0.3 mm to about 2.0 mm; [and]

[the reinforcement cords in each row being spaced from adjacent reinforcement cords in the same row a distance of] adjacent cords in a first of the plurality of rows being spaced a distance d_{a-a} and wherein adjacent cords in a second of the plurality of rows are spaced a distance d_{b-b} and wherein these distances are equal and uniform and about 0.1 mm to about 3.8 mm.

28. (Amended) A pneumatic tire having a body ply which comprises an elastomer sheet and two parallel rows of reinforcement cords embedded therein;

each row comprising between about 50 to about 600 cords;

each cord having a diameter *d* of about 0.3 mm to about 2.0 mm;

[the reinforcement cords in each row being spaced from adjacent reinforcement cords in the same row a distance of] adjacent cords in a first of the plurality of rows being spaced a distance d_{a-a} and wherein adjacent cords in a second of the plurality of rows are spaced a distance d_{b-b} and wherein these distances are equal and uniform and about 0.1 mm to about 3.8 mm;

the reinforcement cords in one row being transversely staggered relative to the reinforcement cords in an adjacent row.

Pending Claims:

2. A green tire as set forth in claim 21, wherein the reinforcement cords in one row are transversely staggered relative to the reinforcement cords in an adjacent row.

3. A green tire as set forth in claim 2, wherein the plurality of rows comprise two parallel rows of reinforcement cords.

4. A green tire as set forth in claim 21, wherein the plurality of rows comprise two parallel rows of reinforcement cords.

5. A green tire as set forth in claim 21, wherein the elastomer sheet is made of rubber.

6. A green tire as set forth in claim 21, wherein the sheet has a thickness of about 0.5 mm to about 2.0 mm.

7. A green tire as set forth in claim 6, wherein the sheet has a width of about 150 mm to about 250 mm.

8. A green tire as set forth in claim 21, wherein each row comprises between about 50 to about 600 cords.

9. A green tire as set forth in claim 8, wherein the cords each have a diameter of about 0.3 mm to about 2.0 mm.

10. A green tire as set forth in claim 9, wherein the reinforcement cords in each row are spaced from adjacent reinforcement cords in the same row a distance of about 0.1 mm to about 3.8 mm.

11. A method of making the body ply for the green tire of claim 21, comprising the steps of:

introducing the reinforcement cords into a die assembly; and

extruding rubber into a cavity of the die assembly so that rubber is forced around and between the reinforcement cords.

12. A method as set forth in claim 11, wherein an insert is positioned upstream of the die cavity and wherein the reinforcement cords pass through the insert.

13. A method as set forth in claim 12, wherein the insert comprises a body portion with a plurality of passages extending from an entrance end to an exit end and wherein the passages are arranged in a plurality of rows corresponding to the desired placement and spacing of the reinforcement cords.

14. A method as set forth in claim 13, wherein the passages are arranged in two parallel rows.

15. A method as set forth in claim 14, wherein the openings in one row are transversely staggered relative to the openings in the other row.

16. A method as set forth in claim 11, wherein said introducing and said extruding steps comprise:

replacing an insert in an existing machine with an insert having the passages corresponding to the arrangement of reinforcement cords in the elastomeric sheet;

passing the reinforcement cords through the replacement insert and into a die assembly of the existing machine; and

extruding rubber into a cavity of the die assembly so that rubber is forced around and between the reinforcement cords.

17. A method as set forth in claim 11, further comprising the step of cutting the body ply material to size to form the body ply.

18. A method of making the body ply for the green tire of claim 21, comprising the steps of:

replacing an insert in an existing machine used to make steel belts or single layer body ply material with an insert having the passages corresponding to the arrangement of reinforcement cords in the elastomeric sheet;

passing the reinforcement cords through the replacement insert and into a die assembly of the existing machine; and

extruding rubber into a cavity of the die assembly so that rubber is forced around and between the reinforcement cords.

21. A green tire incorporating a body ply comprising an elastomeric sheet and a plurality of rows of reinforcement cords embedded therein, the body ply having edges forming an axially extending seam, wherein each of the reinforcement cords has a diameter *d*, wherein adjacent cords in a first of the plurality of rows are spaced a distance $d_{a\text{-}a}$ and wherein adjacent cords in a second of the plurality of rows are spaced a distance $d_{b\text{-}b}$ and wherein these distances are equal and uniform.

22. A green tire as set forth in claim 21, wherein the body ply has sliced edges forming the axially extending seam.

23. A green tire as set forth in claim 21, wherein the reinforcement cords extend substantially parallel to the axis of the green tire.

24. A tire incorporating a body ply comprising an elastomeric sheet and a plurality of rows of reinforcement cords embedded therein, the body ply extending between beads and having lateral end portions turned respectively therearound, wherein each of the reinforcement cords has a diameter *d*, wherein adjacent cords in a first of the plurality of rows are spaced a distance d_{a-a} and wherein adjacent cords in a second of the plurality of rows are spaced a distance d_{b-b} and wherein these distances are equal and uniform.

25. A tire as set forth in claim 24, wherein the reinforcement cords extend substantially parallel to the axis of the tire.

26. A pneumatic tire incorporating a body ply comprising an elastomeric sheet and two parallel rows of reinforcement cords embedded therein;

each row comprising between about 50 to about 600 cords;

each cord having a diameter *d* of about 0.3 mm to about 2.0 mm;

adjacent cords in a first of the plurality of rows being spaced a distance d_{a-a} and wherein adjacent cords in a second of the plurality of rows are spaced a distance d_{b-b} and wherein these distances are equal and uniform and about 0.1 mm to about 3.8 mm.

28. (Amended) A pneumatic tire having a body ply which comprises an elastomer sheet and two parallel rows of reinforcement cords embedded therein;

each row comprising between about 50 to about 600 cords;

each cord having a diameter *d* of about 0.3 mm to about 2.0 mm;

adjacent cords in a first of the plurality of rows being spaced a distance d_{a-a} and wherein adjacent cords in a second of the plurality of rows are spaced a distance d_{b-b}

and wherein these distances are equal and uniform and about 0.1 mm to about 3.8 mm;

the reinforcement cords in one row being transversely staggered relative to the reinforcement cords in an adjacent row.

* * *